

Design and Implementation of Hospital Management System Using Java

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Abstract: *This research work is on design and construction of Hospital Management System (HMS). The system provides the benefits of streamlined operations, enhanced administration & control, superior patient care, strict cost control and improved profitability. The system uses JAVA as the front-end software which is an Object Oriented Programming language and has connectivity with the back-end software.*

Keywords: *HMS- Hospital Management System.*

I. Introduction

Before computerized Hospital Management System came into practice, it was difficult to keep proper records of the daily activities of hospitals, patient information, maintenance schedule of equipments in the hospital, and how funds are being allocated and used. This resulted in waste of money, time and manpower. Hospital Management System is an information management system designed to help manage the various aspects of a hospital (administrative, clinical and financial). It helps in monitoring and controlling the hospital's daily transactions, as well as the hospital's performance. It also helps to address the critical requirements of the hospital. Hospital Management System enables access to the right information and automation of complex task, thereby allowing staff to spend more time caring for patients. Hospital Management System is custom built to meet the specific requirements of the medium and large size hospitals across the globe.

Current Management System

Most hospitals face several challenges with Hospital Management System because some of them are still using manual processes, while the ones that use the computerized method are also faced with the challenge of adjusting to it. Such problems include:

- High cost of software development, deployment and improvement.
- Difficulty in migrating from manual processes, because both staff and patients are used to the manual processes and so are unable to speedily cope with the new system.
- Lack of IT friendly medical personnel is also presenting several challenges.
- Huge influx of patients visiting government hospitals makes the process of migrating to automated processes highly difficult. They do not have the patience to wait for registration and data entry and often fail to understand the functioning of automated processes.

Considering the above, there is need for the improvement of computerized hospital management system to such hospitals as it would help provide and customize clinical data, enable faster diagnosis with ready-made templates, allow doctors to follow advanced medical prescription patterns, and so on.

Hospital Management System

Management has been defined as the process, comprised of social and technical functions and activities, occurring within organizations for the purpose of accomplishing predetermined objectives through humans and other resources (Longest, Rakich & Darr, 2000). Healthcare quality and patient safety are the common mantra of all primary and secondary health care providers. In hospitals, over the years, a variety of models and schemes for hospital interventions and development have been deployed (Friesner, 2009). Hospital Management System provides the benefits of streamlined operations, enhanced administration & control, superior patient care, strict cost control and improved profitability. There are different modules in the process of Hospital Management System. These include:

- Patient management
- Services management
- Appointment scheduling
- Store management
- Pharmacy management

- Admission management
- Ambulatory
- Laboratory
- Account management
- Payroll and Human Resource Management

II. Literature Review

Hospitals can also be regarded as organizations based on high technology and information intensive processes. According to Lawrence and Dyer (1982), such organizations are not hierarchically structured bureaucracies, but are often based on democratic control mechanisms with institutionalized stakeholder influence in decision processes. A survey under 2752 European hospital managers indicates that technology can substantially influence hospital activities and services (Anderson, 1993). It is also expected that health care budgets and funding will depend significantly on sophisticated patient and diagnosis classifications. The use of IT in diagnostic and treatment processes will add to the development of networks of clinical, hospital and health care processes (Smith and Gert van der Pijl, 1999).

Healthcare management is a growing profession with increasing opportunities in both direct and non-direct care settings. As defined by Buchbinder and Thompson (2010), direct care settings are those organizations that provide care directly to a patient, resident or client who seeks services from the organization. Non-direct care settings are not directly involved in providing care to persons needing health services, but rather support the care of individuals through products and services made available to direct care settings.

The construction of medical information is important to improve the hospital medical care capability, the management decision-making level of health and the hospital operational efficiency. Nowadays, comprehensive hospital information services and management platform have been established, centering on electronic medical records and clinical pathway. The establishment and use of these information systems played an important role in improving the degree of patient satisfaction, enhancing hospital efficiency and healthcare quality, protecting the safety of healthcare, and reducing healthcare costs.

Hospital Management System (computerized) is increasingly becoming an emerging tool in health care arena to efficiently enable delivery of high quality health services. These systems have large computerized data bases intended primarily for communication and storing health and administrative information. HMS has different components and includes broad scope and level of systems from departmental (a system limited to a specific clinical or financial domain) to knowledge based systems that provide diagnostic support and intervention for patient care activities. It is believed that HMS implementation is an organizational process conducted toward information technology within user community. User community in health care arena consists of many different user groups (physicians, nurses, administrators, managers, researchers, etc.). Neglect of any of these parties imply to missing related expertise, skills, knowledge, requirements and expectations. Expectation and requirement arise from what users see and hear about the system and interpret the ways the system will work for them. Studies indicated that addressing user expectation is a distinct element to ensure the successful adoption of the HMS (Farzandipour, Sadoughi and Meidani, 2010).

In health care organizations, many different user groups (physicians, nurses, administrators, managers, radiologists, pharmacists, etc) with variety of backgrounds and conflicting interest exist. Implementation of a hospital information system could not happen without an analysis of the feelings and perceptions of individuals who make use of it (Ndira, Rosenberger, and Wetter, 2008).

III. Methodology

This HMS is based on the database, object-oriented programming language and networking techniques. My SQL (Structure Query Language) is used in areas where keeping the records in the database is necessary, this system uses JAVA as the front-end software which is an object-oriented programming technique and has connectivity with My SQL, the back-end software.

IV. Results And Discussion

The study indicates that maximum user's expectations were supported. The Hospital Management System software meets user requirement relating to entering patient data (figure 1). It shows the number of patients registered in the hospital database (figure 2). The system also was able to show patients past medical records such as diagnosis, drug prescription and dosage (figures 3 and 4). The system also gives the number of in-patients in the hospital at that particular time and what they are being treated for (figure 5). A drug database was also established, where the pharmacy can input the particular type of drug available at that particular time so that doctors can know which drugs are readily available to be prescribed to patients (figure 6).

Register Patient

REF_NO DATE Jul 1, 2014

FIRST NAME LAST NAME

MIDDLE NAME MARITAL STATUS Married

NEXT OF KIN'S NAME RELATIONSHIP TO NEXT OF KIN

SEX Male DATE OF BIRTH Jul 1, 2014

EMAIL TELEPHONE

CONTACT ADDRESS ADDRESS OF NEXT OF KIN

STATE OF ORIGIN Abia LOCAL GOVERNMENT

BLOOD GROUP GENOTYPE

UPLOAD PICTURE

Figure 1: Registration page

Search

REF NO	FIRST NAME	MIDDLE NAME	LAST NAME	GENDER	MARITAL ST
ER101	ADE	WADA	DAYO	MALE	Married
RX877	CHIKA	JAMES	ANDREW	MALE	Single
RX117	HALIMAT	HAJIYA	HASSAN	MALE	Married
RX123	JAKANDE	JOHNSON	WADE	MALE	Married
IOP	LAIDE	DANJUMA	ADEGITE	MALE	Married

Figure 2: Patient's database

Electronic Health Record for IOP

Bio Data

ADEGITE LAIDE DANJUMA

Gender: MALE Date of Birth: 1-6-2014

Phone: 07877 Next of Kin: MALE

Address: 49 AJJA WAY, LEKKI LAGOS STATE

Genotype: AA

Blood Group: AB

Medical History

DATE	DIAGNOSE
2014-06-18	MALARIA
2014-06-18	DIABETIS

DATE	DRUG	PRESCRIP
2014-06-17 07:04:41.0	PANADOL	TWICE A D
2014-06-17 07:04:41.0	TRAMADOL	ONCE DAIL
2014-06-17 07:04:41.0	COUGH SYRUP	ONCE A DA
2014-06-18 16:27:54.0	VITAMIN C	ONE THRE
2014-06-18 16:27:54.0	VITAMIN D	TWO THRE

Figure 3: Patient's record

WADE JAKANDE JOHNSON

View EHR

Genotype: AS

Blood Group: AB

Gender: MALE

Phone: 09066664

Date of Birth: 3-6-2014

Next of Kin: MALE

Address: LEKKI LAGOS

Diagnosis: _____

Doctors Comment: _____

Submit

Figure 4: Diagnosis form

REF NO	FIRST NAME	MIDDLE NAME	LAST NAME	GENDER	MARITAL ST
ER101	ADE	WADA	DAYO	MALE	Married

Figure 5: In-Patient Database

Drug: _____ Add

Select	Drug
<input type="checkbox"/>	PANADACIL
<input type="checkbox"/>	VITAMIN C 500MG
<input type="checkbox"/>	VITAMIN D 50MG

Remove

Figure 6: Drug Database

V. Conclusion

Hospital Management System not only provides an opportunity to the hospital to enhance their patient care, but also can increase the profitability of the organization. Hospital administrators would be able to significantly improve the operational control and thus streamline operations. This would improve the response time to the demands of patient care because it automates the process of collecting, collating and retrieving patient information.

VI. Recommendation

It is recommended that hospitals currently practicing the manual system Hospital Management should switch to the electronic system because it is more efficient and easier to use. Also, since the use of computers is growing fast globally, introducing the electronic system will enable hospitals fit into the current global trend.

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